

What is claimed is:

1. A deformable mirror having a displacement detecting function, comprising:  
a flexible thin film having a reflecting surface and an upper electrode to be de-  
formed by electrostatic attraction: and  
a control electrode and a capacitance detecting electrode, located opposite to said  
flexible thin film,  
wherein a displacement of said reflecting surface can be calculated from a static  
capacitance between said upper electrode and said capacitance detecting electrode.
2. A deformable mirror having a displacement detecting function according to  
claim 1, wherein said control electrode is also used as said capacitance detecting  
electrode.
3. A deformable mirror having a displacement detecting function according to  
claim 1, wherein said control electrode and said capacitance detecting electrode are  
configured separately as an identical layer.
4. A deformable mirror having a displacement detecting function according to  
claim 1, wherein said control electrode and said capacitance detecting electrode are  
configured separately as different layers.
5. A deformable mirror having a displacement detecting function according to any  
one of claims 1-4, wherein a high-frequency voltage for detecting said static capaci-  
tance having a frequency much higher than a mechanical resonant frequency of said  
reflecting surface is superposed on a voltage of a constant-voltage source for de-

5 forming said reflecting surface, and a resistance is connected to a grounding side of said upper electrode to detect an amount of displacement of said reflecting surface from a phase and amplitude of an electric current flowing through said resistance.

6. A deformable mirror having a displacement detecting function according to any one of claims 1, 3 or 4, wherein a high-frequency voltage of a frequency much higher than a mechanical resonant frequency of said reflecting surface is applied to said capacitance detecting electrode, and a resistance is connected to a grounding side of said upper electrode to detect an amount of displacement of said reflecting surface from a phase and amplitude of an electric current flowing through said resistance.

7. A deformable mirror having a displacement detecting function, comprising:

a flexible thin film having a reflecting surface and an upper electrode to be deformed: and

a control electrode and a capacitance detecting electrode, located opposite to said flexible thin film,

wherein a displacement of said reflecting surface can be calculated from a static capacitance between said upper electrode and said capacitance detecting electrode.

8. A deformable mirror having a displacement detecting function according to claim 7, wherein said control electrode is also used as said capacitance detecting electrode.

9. A deformable mirror having a displacement detecting function according to claim 7, wherein said control electrode and said capacitance detecting electrode are configured separately as an identical layer.

10. A deformable mirror having a displacement detecting function according to claim 7, wherein said control electrode and said capacitance detecting electrode are configured separately as different layers.

11. A deformable mirror having a displacement detecting function according to any one of claims 7-10, wherein a high-frequency voltage for detecting said static capacitance having a frequency much higher than a mechanical resonant frequency of said reflecting surface is superposed on a voltage of a constant-voltage source for deforming said reflecting surface, and a resistance is connected to a grounding side of said upper electrode to detect an amount of displacement of said reflecting surface from a phase and amplitude of an electric current flowing through said resistance.

12. A deformable mirror having a displacement detecting function according to any one of claims 7, 9 or 10, wherein a high-frequency voltage of a frequency much higher than a mechanical resonant frequency of said reflecting surface is applied to said capacitance detecting electrode, and a resistance is connected to a grounding side of said upper electrode to detect an amount of displacement of said reflecting surface from a phase and amplitude of an electric current flowing through said resistance.

13. A variable optical-property element having an optical surface to be deformed, wherein a static capacitance between an electrode provided adjacent to said optical surface to be deformed and a fixed electrode provided opposite to said electrode is detected and thereby a displacement of said optical surface can be detected.

14. A variable optical-property element according to claim 13, wherein an electrode for deforming said optical surface is also used as an electrode for detecting said static

capacitance.

15. A variable optical-property element according to claim 13, wherein said variable optical-property element is a lens.

16. A variable optical-property element according to claim 13, wherein said variable optical-property element is a variable mirror.

17. A variable optical-property element according to claim 13, wherein said variable optical-property element is a prism.

Patent Cooperation Treaty